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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mark J. Childs

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BRIARCLIFF MANOR, NY 10510

EXAMINER

ZHOU, HONG

ART UNIT

PAPER NUMBER

2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,868	Applicant(s) CHILDS, MARK J.	
	Examiner HONG ZHOU	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Preliminary Amendment

1. Acknowledgement is made of the amendment filed by the applicant on June 27, 2006, in which claims 4-5, 7, 9 and 13 are amended. Claims 1-13 are currently pending in U.S. Patent Application No. 10/596,868 and an office action on the merits follows.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-6, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US 2005/0156829, hereinafter Choi) in view of Kane et al (US 6, 618,030, hereinafter Kane).

Regarding claim 1, Choi discloses an active matrix electroluminescent display device (Figs. 1 and 2) comprising an array of display pixels (140), each pixel comprising: an electroluminescent display element (OELD, Fig. 2); a drive transistor (M3, Fig. 2) for driving a current through the display element (OELD); an address transistor (M1, Fig. 2) for providing a pixel drive signal from a data line (110, Fig. 2) to the gate of the drive transistor (M3); and a shorting transistor (transistor M2, compensating the characteristic of the transistor M3 in

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response to a compensation signal SEL2, also see [0042-0046] at page 3) connected between the gate and drain of the drive transistor (M3). It is noted that Choi fails to disclose wherein the display device further comprises means for measuring a voltage on the data line.

However, Kane discloses an organic LED display device similar to Kane wherein the display device comprises a measuring module (1330, Fig. 13) for measuring the drive transistor's threshold voltage on a data line (data line 1210, Fig. 13; col. 4, lines 66-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electroluminescent display device of Choi with the feature of a measurement module for measuring the voltage of a data line and adjusting the input pixel data as taught by Kane so as to improve brightness uniformity (col. 2, lines 14-17).

Regarding claim 2, Choi further discloses a device as claimed in claim 1, wherein the EL display element (OELD) and the drive transistor (M3) are connected in series between first (Power line VDD) and second power lines (ground line, Fig. 2).

Regarding claim 4, Choi discloses a device as claimed in claim 1, wherein the data input line (110) is switchable between a voltage driving mode in which it provides voltages to the pixels connected to the line (see [0043], page 3) and a floating mode in which it can float to the voltage of the gate of the drive transistor of an addressed pixel (see [0049], page 3).

Regarding claim 5, Choi as modified by Kane discloses a device as claimed in claim 1, wherein each pixel is operable in two modes: a first, threshold voltage measuring mode, in which the display element is disabled (e.g. during the auto-zero phase, the LED's turn-on voltage is measured, see col. 4, lines 66-67 of Kane), the address transistor (M1 of Choi) is turned on and the shorting transistor (M2 of Choi) is turned on; and a second, pixel drive mode (M3 is turned

on in Choi), in which the display element is enabled, the address transistor (M1 of Choi) is turned on and the shorting transistor (M2 of Choi) is turned off (see [0043] and [0049] at page 3).

Regarding claim 6, Choi as modified by Kane discloses a device as claimed in claim 5, wherein during the first, threshold voltage measuring mode, during a first period a predetermined voltage is applied to the data line so that a current is driven through the drive transistor (see col. 4, line 64 to col. 5, line 12 of Kane) and during a second period the data line is allowed to float so that the voltage on the data line (6) substantially follows the gate voltage of the drive transistor (see [0049], page 3 of Choi).

Regarding claim 9, Choi discloses a device as claimed in claim 1, further comprising a storage capacitor (C1) between the gate and source of the drive transistor (M3) (Fig. 2).

Regarding claim 10, Choi discloses a method of addressing the pixels of an active matrix electroluminescent display device (Fig. 1 and Fig. 2), comprising an electroluminescent (EL) display element (OELD) and a drive transistor (M3, Fig. 2) for driving a current through the display element (OELD), the method comprising: disabling the display element (2); applying a first voltage to a data line (110); driving a current through the drive transistor (M3, Fig. 2), through a shorting transistor (M2, Fig. 2) connected between the gate and drain of the drive transistor (M3, Fig. 3) and through an address transistor (M1) connected between the gate of the drive transistor (M3) and the data line (110, Fig. 2), allowing the data line (110) electrically float (see [0045] at page 3). It is noted that Choi does not specifically disclose measuring a voltage on the data line; and modifying a data voltage to be applied to the drive transistor using the voltage measured on the data line.

However, Kane discloses an organic LED display device similar to Kane wherein the display device comprises a measuring module (1330, Fig. 13) for measuring the drive transistor's threshold voltage on a data line (data line 1210, Fig. 13; col. 4, lines 66-67) and modifying a data voltage to be applied to the drive transistor using the voltage measured on the data line (see Figs. 17 and 18). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electroluminescent display device of Choi with the feature of a measurement module for measuring the voltage of a data line and adjusting the input pixel data as taught by Kane so as to improve brightness uniformity (col. 2, lines 14-17).

Regarding claim 11, Choi discloses a method as claimed in claim 10, wherein disabling the display element comprising applying a disable voltage to a terminal of the display element (e.g. the OLED is connected to ground when the display element is disabling).

Regarding claim 12, Choi discloses a method as claimed in claim 11, wherein disabling the display element comprising applying a disable voltage to terminal (34) of the display element (2) which is common to all display elements.

Regarding claim 13, Choi as modified by Kane discloses a method as claimed in claim 10, further comprising enabling the display element (e.g. when the drive M3 is turned "on"), and addressing the pixel with the modified data voltage on the data line (e.g. when the address transistor M1 is turned "on"), with the shorting transistor (e.g. transistor M2) turned off (see [0049] at page 3, the transistor M2 is cut off).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US2005/0156829, hereinafter Choi) in view of Kane et al (US 6, 618,030, hereinafter Kane), and further in view of Libsch et al (US 7,167,169, hereinafter Libsch).

Regarding claim 3, Choi in view of Kane discloses a device as claimed in claim 2. However, both Choi and Kane fail to wherein the voltage on the second power line is switchable between two values, one of which causes the EL display element (2) to be turned off. However, Libsch discloses an active matrix oled voltage drive pixel circuit including an organic light emitting diode (550) and a drive transistor (Q2) connected in series between first (V1) and second power lines (V4). Libsch further discloses whererin the voltage (V4) on the second power line is switchable between twp values (e.g., 0V and 15V), and when the voltage is set to 15V the OLED is turned off; Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electuminecent display device of Choi and Kane with the features of different voltage levels in one terminal of the OLED as taught by Libsch so as to provide an AC driving for the OLED which would prolong the life of the OLED.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (US 2005/0156829, hereinafter Choi) in view of Kane et al (US 6, 618,030, hereinafter Kane), and further in view of Tokioka et al (US 7,079,094, hereinafter Tokioka).

Regarding claim 7, Choi discloses a device as claimed in claim 1. Choi fails to disclose wherein the drive transistor (22) is a polysilicon TFT. However, Tokioka discloses an electroluminescence display (Fig. 7) using a low-polysilicon TFT as a drive transistor of an organic light emitting device (col. 1, lines 21-31). Therefore, it would have been obvious to one

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of ordinary skill in the art at the time the invention was made to modify the electroluminescent display device of Choi with the feature of a low temperature polysilicon TFT as taught by Tokioka for driving the OLED because a driving transistor using low temperature polysilicon TFT provides higher definition of an image and lower power consumption (col. 1, lines 21-31).

Regarding claim 8, Tokioka further discloses a device as claimed in claim 7, wherein the drive transistor (22) is a low temperature polysilicon TFT (col. 1, lines 21-31).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The US 2004/0100430 and 2004/0189559 are cited to teach active matrix OLED device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HONG ZHOU whose telephone number is (571)270-5372. The examiner can normally be reached on Monday through Friday 8:30 A.M. - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571)272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. Z./

Examiner, Art Unit 2629

/Amare Mengistu/

Supervisory Patent Examiner, Art Unit 2629